GLOBAL JOURNAL OF BIO-SCIENCE AND BIOTECHNOLOGY

www.scienceandnature.org

EFFECTS OF ADDING CRUSHED GINGER, CELERY SEEDS AND THEIR COMBINATIONS TO THE BROILER BREEDERS DIETS ON PERFORMANCE TRAITS AND THEIR PROGENY CHARACTERISTICS

Ahmed Abdullah Abbas[1], Shlimoon Hanna Jajo[2] & Zaed Jamel Mohammed Saeid[1]
[1]College of Agric./ Univ. of Anbar [2] State Board of Agric. Research-Ministry of Agric. – Iraq

ABSTRACT
This study was carried out at the poultry research station in animal resources dept. / State Board of Agricultural Research/ Ministry of Agriculture-Iraq). The duration of this study was from 28-11-2010 to 15-5-2011 to evaluate the supplementation of different levels of crushed seeds of *Apium gravelns* and *Zingber officinale* and its combinations on certain performance traits of two strains of broiler breeder hens (Arbor Acres and Ross308). A total of 432 parent and 36 rosters were used in this study (experiment 1). Parents were randomly distributed to 9 treatments. The results indicated that there is superiority in the most of treatments of food additives in the percentage of egg production EN (HD), egg weight EW (g), the relative weight of the egg shell and egg mass EM (g eggs/day). Treatments of feed additives indicated to improve reproductive performance of broiler breeder, surpassed most of treatments in this study compared with control in the overall mean of the total eggs character hatchability of fertilized eggs. There improvement was observed in most of treatments under this study compared to the control in the fertility rate, average of the hatching from total eggs and hatching from fertilized eggs. Results showed a superiority of Ross breeder in the proportion of egg production, egg weight and egg mass, while the Arbor Acres breeder ahead in the percentage of cracked eggs from fertilized eggs and total eggs. In addition to that, hatched chicks from broiler breeders (experiment 2) were fed on treated diets surpassed in body weight, body weight gain, feed intake, dressing percentage and decreased feed conversion ratio at 42 days of age compared to the control.

KEYWORDS: Crushed ginger, celery seeds, broiler feeding, progeny characteristic

INTRODUCTION

Hatching and fertilizations problems are crucial in broiler breeders (Barreto and Basillico, 2008). Many researchers have defined fertility as it is the common performance of both the male and the female, and this performance depends mainly on growth and development of the embryo during hatching period that join unsaturated fatty acids in the embryos tissues (Surai, et al, 2001; Surai and Dvorska, 2002a). This makes the embryos tissues highly sensitive to fatty acids oxidation and the free radicals during hatching period, especially the brain since it is more sensitive than any other parts to the free radicals (Surai et al, 1999), causing an increase in embryonic distrusting, in addition , the raises in the unsaturated fatty acids in testis tissue and the semen, and the decrease of antioxidant activities make the reproductive system much more part sensitive than other body systems (Surai et al 2003). This demands developing anti-oxidation in the tissues to prevent fatty oxidation to limit the oxidation stress by active oxygen and fatty peroxides. Many recent studies showed that using plants and medical herbs as feed additives to the animal diets to activate its components (Mehmet et al, 2005) as growth stimulation (Sarinivasan, 2005), anti-fungal (Taha, et al, 2005), improve the immune system (Durranim et al, 2007) and anti-oxidant (Taha, 2008; AbdurRahman and AlKattan, 2009), celery seed extracts have effectuated anti-oxidant or preventing the damage caused by oxidation to the fatty, amino-acids, proteins, increase glutathione and reduce malondialdihyde in mice (AsSadoon, 2005). Shanoon, (2011) pointed out that liquid ginger extract can work as anti-oxidant as well as improving the reproductive performance to the male in broiler breeder. Natural herbs are available, especially celery seeds and ginger greatly in many countries, as well as its cheap prices and they are considered important source of nutrition on the other hand the rarity of studies and the scientific references were the main reason to accomplish this study aiming to follow the effects of these additives to productivity characteristics to the different breeders and to compare between their performances and following the nutritional effects to these additives upon theirs produced progeny.

MATERIALS & METHODS

This study conducted in poultry research station in animal resources dept. / State Board of Agricultural Research/ Ministry of Agriculture –Iraq, from 28/11/2010 to 15/5/2011. Experiment 1 was conducted to know the effects of adding crushed ginger and celery seeds separately or combined to the diets to broiler breeders on the productivity and reproductive performances, a period of 168 days divided into six intervals each of 28 days, The breeders were fed on nine equal energy diets (2870 Kcal/Kg), (16.1%) and protein, the diet contained: the first treatment without any additives, the second and the third treatment contained 2.5 and 5.0 Kg/Ton crushed ginger respectively, the fourth and the fifth contained 2.5

and 5.0 Kg/Ton celery seeds respectively, whereas the sixth, seventh, eighth and the ninth contained combinations of crushed ginger and celery seeds as followed: (2.5:2.5 ; 2.5:5.0 ; 5.0:2.5 and 5.0:5.0) Kg/Ton respectively. The breeders were put in air-conditioned (Pad system). Experiment 2 was conducted to evaluate the affect of maternal diets on productive performance of the produced progeny. The productive and physiological characteristics of the hens were measured such as: egg production EN, egg weight EW(g), egg mass EM(g/day), relative weight of the shell RSW(%) eggs not valid for hatching(Cracked eggs) CE(%), fertility ratio FER(%), hatching ratio of fertilized eggs (%) and hatching ratio of total eggs (%). Reproductive characteristics such as: body weight at hatching time HW(g), body weight BW(g) and total feed consumption FC(g). The feeding of the chicks was *Ad libitum* throughout the experiment on a standard equal energy diet: (3062 Kcal/ Kg start and 3155 Kcal8/Kg grow)and protein (22.56% start and 200% grow).

Statistical analysis were conducted according to CRD and a comparison between the means were made using Duncan test (1955) with statistical (SAS, 2001) program.

RESULTS & DISCUSSION

Table (1) shows the effect of adding crushed ginger and celery seeds and their combinations on the ratio of egg production (HD), to the two breeders used in the experiment. The fifth, sixth, seventh and eighth treatments exceeded the rest, they were 76.2, 76.4, 75.5, 77.0 % respectively, followed by sixth treatment (76.2%) then the second, the third and the fourth with 72.5 , 73.4 , 72.1 % respectively. Overall the treatments with the additives were exceeding the first treatment (the control) in egg production where it recorded the lowest value of (70.0%).The results in table (1) also showed the overall mean of egg producing for each breeder, which exceeded the fifth, seventh, eighth and the ninth in the rest of the treatment in Arbor Acres, with the results as: 76.1 , 75.9 , 76.1 , and 77.0 % respectively. The control treatment recorded the lowers value in significant between all the rest of the treatments by 69.3%. Whereas Ross breeder treatments the fifth, sixth and the ninth 76.3 , 76.9 , 77.1 % respectively were ascendant, followed by the third, the sixth and the eighth with the values: 74.7 , 75.4 , 74.9 % respectively, there were no significant differences between the second and the fourth treatments with the control treatment which recorded the lowest values of: 72.7 , 71.3 , 70.7 % respectively. The results in table (1) showed no significant differences between the two breeders.Table (1) shows the effect of adding the crushed ginger and celery seeds and their combinations on the egg weight(g), the additives treatment in general were ascendant in the weight of the eggs for both of the breeders in the experiment when compared with the first treatment (the control) and the second treatment. The third, and the fourth treatment have exceeded significant the ninth, the first and the second treatment and there were no significant differences between them and the fifth, sixth seventh and the eighth treatment. The superiority of the treatment in Arbor Acres breeder was similar to the general average, the third, fourth fifth and the eighth have exceeded the first and the second treatment with the values: 64.2 , 64.4 , 64.7 and 64.0g respectively, this was not significant with the sixth, seventh and the ninth treatment which were: 63.9 , 63.8 and 63.6g respectively. Whereas in Ross breeder the effect was different, the fourth treatment exceeded the rest in overall mean with the value of 66.8 g, with no significant difference with the second treatment of the value: 65.0 g. The results in table (2) showed also that Ross breeder exceeded significant Arbor Acre breeder in the egg weight with the values: 64.87 and 63.7 g respectively.

It is noticeable that all the treatments exceeded in overall menthe control treatment regarding the mass of the egg (egg g/ hen / day), the fifth, seventh eighth and the ninth treatments: 49.2, 49.4, 49.05 and 49.0g respectively exceeded the second and the fourth treatments 47.65 and 47.55 g respectively. It is found that the effect of the treatments in the Arbor Acres breeder is similar to the general average, all the additive treatment exceeded the control treatment, and the fifth, seventh, eighth and the ninth treatments recorded the values: 48.9, 48.7, 49.2 and 49.2g respectively exceeded the second treatment (45.3g) which in turn exceeded the first treatment which recorded less average to this characteristic (43.8g). This effect was commensurate with the exceeding of the additive treatments in Ross breeder, the second, fifth, seventh and the ninth treatments are 50.0, 49.5, 50.1 and 49.8g respectively exceeded the fourth treatment (47.8 g), which in turn exceeded the control treatment (44.8g). Ross breeder exceeded Arbor Acres breeder in the egg mass (egg g/ hen/ day), and those values were: 48.63 and 47.57 respectively. It is also noted that there were significant differences between general averages to relative weight of the shell RSW (%) among the food additive treatments, the sixth treatment exceeded the ninth 10.8 and 10.0 % respectively, and there were no significant differences between them and the rest of the treatments. The results pointed out the exceeding of the fourth, sixth and the ninth treatments in the overall mean of the relative weight of the shell on the rest of the treatments, they recorded: 10.8, 11.0, 10.8 % respectively, without and significant differences between them and the second treatment (10.5 g). Whereas in Ross breeder the second, fifth sixth, seventh and the eighth treatments exceeded the control and the fourth treatments which they recorded: 10.0, 10.25 respectively. No significant differences were recorded between Arbor Acres and Ross in the relative weight of the shell; the ratios were 10.45 and 10.55 % respectively. The first treatment recorded the highest number of invalid hatching eggs (cracked eggs) CE (%) out of the rest of the treatments of the ratio of 3.13%, this was not significant wit the second or the fourth treatment, the eighth and ninth treatments recorded the lowest ration of 1.95 and 1.85 % respectively.

ISSN 2278 – 9103

TABLE 1: Effects of adding crushed ginger, celery seeds and their combinations on productive traits in broiler breeders (%)

			EN (HD)			EW (g)			EM (g eggs/day)			RSW (%)			CE(%)		
t	Celery	Ginger	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	Mean
t1	0.0	0.0	69.3 1.98 c±	70.7 3.12c±	**70.0** 2.02d±	62.6 0.83b±	±64.4 0.89b	63.60 0.25c±	43.8 c**1.03**±	44.8 c**0.65**±	44.3 c**1.56**±	10.1 b	10 B	10.6 ab	2.78 0.04a±	3.48 0.02a±	3.13 1.00a±
t2	0.0	2.5	72.3 1.85 d±	72.7 ±2.15c	72.5 ±2.08c	62.1 0.13b±	65.0 0.13ab±	63.50 0.35c±	45.3 b**0.98**±	50 a**0.87**±	47.65 b**0.89**±	10.5 ab	10.7 A	10.6 ab	2.36 0.01ab±	2.98 0.01b±	2.67 1.10ab±
t3	0.0	5.0	74.2 ±0.89b	74.7 ±1.25b	73.4 ±3.01c	64.2 0.37a±	64.2 0.77b±	65.30 0.21a±	47.9 ab**0.28**±	48.3 ab**0.66**±	48.1 ab**1.11**±	10.3 b	10.6 ab	10.4 ab	1.91 0.02b±	2.3 0.02bc±	2.1 1.01b±
t4	2.5	0.0	72.9 ±1.15d	71.3 ±2.05c	72.1 ±1.89c	64.4 0.89a±	66.8 0.85a±	65.60 0.91a±	47.3 ab**0.45**±	47.8 b**1.09**±	47.55 b**0.12**±	10.8 A	10.2 b	10.5 ab	2.46 0.01a±	2.93 0.01b±	2.69 0.99ab±
t5	5.0	0.0	76.1 ±1.05a	76.3 ±3.14a	76.2 ±1.98a	64.7 0.68a±	64.6 0.56b±	±64.60 0.56ab	48.9 a**0.38**±	49.5 a**1.07**±	49.2 a**0.28**±	10.2 b	10.8 a	10.5 ab	1.91 0.01b±	2.08 0.02c±	1.99 0.1b±
t6	2.5	2.5	73.9 ±1.72b	74.5 ±2.58b	74.2 ±2.58b	63.9 0.64ab±	64.8 0.34b±	±64.40 0.45ab	47.9 ab**0.71**±	48.5 ab**0.99**±	48.2 ab**0.89**±	11 a	10.7 a	10.8 a	1.96 0.02b±	2.58 0.01b±	2.27 1.01b±
t7	2.5	5.0	75.9 1.52ab ±	76.9 ±2.36a	76.4 ±3.46a	63.8 0.32ab±	64.9 0.22b±	±64.90 0.85ab	48.7 a**1.82**±	50.1 a**1.32**±	49.4 a**1.18**±	10.2 b	10.7 a	10.4 ab	1.78 0.01b±	2.38 0.01b±	2.08 1.02b±
t8	5.0	2.5	76.1 ±1.43a	74.9 ±3.42b	75.5 ±3.54ab	64.0 0.82a±	64.9 0.35b±	±64.50 0.23ab	49.2 a**1.02**±	48.9 ab**1.06**±	49.05 a**1.24**±	10.2 b	10.9 a	10.5 ab	1.86 0.01b±	2.05 0.01c±	1.95 0.89bc±
t9	5.0	5.0	77.00 ±1.50a	77.1 ±1.89a	77.0 ±3.30a	63.6 ±0.72ab	64.3 0.45b±	±64.00 0.42b	49.2 1.08± a	49.8 a**1.32**±	49 a**1.56**±	10.8 a	10.4 ab	10 b	1.86 0.03b±	1.85 0.01c±	1.85 0.98c±
Breeder Mean			74.18 2.23±A	74.34 2.15±A		2.25±63. 70 B	2.08±64. 87 A		1.23±47. 57 B	1.04±48. 63A		10.45 A	10.55 A		0.01±2.08 B	0.01± 251A	

[a—c] Mean values within a column with no common superscript differ significantly (P ≤0.05).
[A—B] Mean values within a row with no common superscript differ significantly (P ≤0.05)

It can be seen from table (1) that the first and the fourth treatment exceeded the general ratio of the invalid hatching eggs in the Arbor Acres breeder over the rest of the treatments with 2.87 and 2.46 %respectively, and this was not significant with the second treatment of 2.36%. the first treatment exceeded all of the rest of the treatment in the overall mean of the character in Ross with the highest significant value of 3.84 %, the best treatment was the ninth which recorded the lowest invalid hatching eggs ratio followed by the fifth and the eighth with 1.85, 2.05 %respectively. Table (1) also showed decrease in invalid hatching eggs in Arbor Acres breeder comparing with Ross breeder with 2.08 and 2.51 % respectively.The positive results reached from treatments with adding crushed ginger and celery seeds and their combinations to broiler breeder comparing with control diet without any additives regarding the production characteristic such as the significant increase in egg production (HD%), egg weight (g), egg mass (g/day) and significant decrease in invalid hatching ratio (%) might be due to supply the body with the nutrients and the healthy components, because many references and studies showed that those two plants contain many of the general nutrients and components of synergistic effects (Shalaby et al, 2004; Shalaby and Zprba, 2010), and in a similar study (Nasiroleslami, Torki, 2010) noticed there were no significant differences when adding ginger to the broiler breeder consumed diet and the food conversion efficiency while there was an increase in the weight and thickness of the egg shell. Other results were reached by (Zhao et al, 2011) proved that there were no significant differences in average feed consuming and the weight of the eggs when adding ginger tubers to the feed at a rate of (5, 10, 15, 20 g/ Kg feed) when compared to the control. While (Akdarian et al, 2011) found significant differences in adding ginger to the feed at a rate of (0.5, 0.75%) increasing eggs but did not find any significant differences in egg weight comparing to the control. Celery seeds contain high ratio of fat and different components, like Limonene which could get to 68% of the whole seeds fat and B-Selinen and 3-n-bthylphthalide (Raghavan, 2007) and that the ginger contain Limonene, Camphene and Zingerone components (ICMR, 2003), as well as these two plants contain different variety of vitamins and minerals might improve the digestive system through increase the liver activities and increase the activity of the enzymes (Bahar et al, 2002) or through protecting the gut (Whitehouse et al, 2001) then improving the inner physiological environment to the poultry (proteins and blood fat) and regulating the bile secretions (Tsi and Tsi, 2000), and improving digestive pancreatic and gastrointestinal enzymes (Patel and Srinivasan, 2000), these components might improve the intestine. These results agree with what (Shalal and Yousif, 2012) found, they noticed the improvements the productive and the physiological performance of the broiler breeders when they used crushed ginger it reduced the number of bacteria on one side and improving the length of the villi and the depth of the crypts and eventually improving the complete body health. The results in table (2) showed the effects of adding the crushed ginger and the celery seeds and their combinations on the fertility ratio (%), the eighth and the ninth treatment exceeded the rest of the treatments in overall mean of the character and there were no significant differences between them and the fifth and seventh treatments, their average values were 92.8, 92.95, 91.2 and 91.0 % respectively, the first, second and fourth treatments came the lowest in fertility rate and with significant differences against the rest, they were: 81.8, 83.3, and 83.3 % respectively. While the seventh eighth and the ninth treatments exceeded the rest of the treatment and the control treatment in Arbor Acres breeder with the values of 92.6, 92.6 and93.0 % respectively and the first, second fourth and the sixth treatments reached the lowest significant fertility rate, with the values: 81.2, 82.2, 82.4 and 88.8 % respectively, without any significant differences between Arbor Acres and Ross breeders in the overall fertility rate (%) which was 88.69 and 88.1% respectively. Now regarding the whole hatching ratio of all of the eggs, the eighth and the ninth treatments on average were preponderant with theses values 81.1 and 79.9 % respectively and there were no significant differences between them and the sixth and the seventh treatments. The first and the third treatments were the lowest of all in the hatching ratio of all of the eggs with the values of 66.7; 70.7 % respectively. The fourth, eighth and the ninth treatments were better in the hatching ratio of all of the eggs in average in the Arbor Acres breeder, the differences between them and the rest of the treatments with: 81.6, 80.88, 82.23 and 80.82 % respectively, and the control treatment was the lowest with significant difference compared with the rest understudy with the value of 67.67 %. While Ross breeder the fifth, seventh eighth and the ninth treatments in overall mean exceeded the rest of the treatments with the values: 76.86, 78.18, 80.13 and 78.71 % respectively, the first and the third were at the lowest in hatching ratio of all of the eggs with the values: 65.9, 66.9 % respectively. Now when comparing the two breeders we notice from table (2) that breeder Arbor Acres exceeded Ross breeder significant in hatching ratio of all of the eggs, with the values: 77.8, 73.95 % respectively. The results in this study showed and significant increase of ($p \leq 0.05$) in fertilizing ratio (%) in the fifth, seventh eighth and ninth treatments of (1.8 – 10.6) % In Arbor Acres breeder, and also an increase in the second, third fifth seventh and the ninth treatments of (9 – 11.8) % in Ross breeder compared with the control treatment of 82.4 and 81.2 % for both the Arbor Acres and the Ross breeder respectively. Adding crushed ginger and celery seeds and their combination have accomplished an increase in hatching eggs of the fertilized eggs by 3.88 – 6.47 % in Arbor Acres, and 2.8 – 4.4 % in Ross breeder, compared with the control treatment of 82.96 and 81.8 % respectively. When calculating the increase in the whole eggs hatching, it was 6.93 – 14.56 % for the Arbor Acres breeder and 4.1 – 14.23 % for the Ross breeder comparing with both of the control treatment which was 67.67 – 65.9 % respectively.

TABLE 2: Effects of adding crushed ginger, celery seeds and their combinations on fertility and hatchability traits (%)

			FER %			Hatch of Fertile%			Hatch of Total %		
T	Celery	Ginger	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	Mean
t1	0.0	0.0	82.4 4.32d ±	81.2 3.25c±	81.8 4.89c±	82.96 4.05c±	81.8 4.38b±	82.3 6.78c±	67.67 2.30d±	65.9 4.18d±	66.7 2.08d±
t2	0.0	2.5	84.4 3.89c ±	82.2 3.85c±	83.3 5.00c±	89.43 5.06a±	81.8 5.87b±	84.7 6.85b±	77 2.04b±	74.34 3.58b±	75.67 2.70bc±
t3	0.0	5.0	88.2 4.00b ±	90.8 5.08b±	89.5 4.80b±	87.95 2.04ab±	85.8 6.09a±	86.8 5.79a±	74.64 .07c±	66.9 3.56d±	70.7 3.32d±
t4	2.5	0.0	84.2 3.87c ±	82.4 4.48c±	83.3 5.01c±	87.38 6.89ab±	84.7 5.19a±	86.04 4.99a±	81.6 5.00a±	70 4.01c±	75.8 3.45c±
t5	5.0	0.0	91.0 6.01ab ±	91.4 3.85b±	91.2a 5.58b±	87.87 6.08ab±	84.6 4.98a±	86.2 6.58a±	76.8 2.89bc±	76.86 2.89a±	76.8 4.08b±
t6	2.5	2.5	89.0 5.21b ±	88.8 4.04b±	88.9 4.66b±	86.84 5.07b±	83.8 4.08ab±	85.32 6.42ab±	80.88 3.07a±	74.5 3.05b±	77.7 3.20ab±
t7	2.5	5.0	92.6 5.09a ±	90.2 5.11b±	91.4 5.25ab±	87.9 7.01ab±	86.2 5.18a±	87.16 7.51a±	78.7 4.01b±	78.18 3.00a±	78.4 3.00ab±
t8	5.0	2.5	92.6 6.01a ±	93.0 6.01a±	92.8 6.00a±	88.75 6.04a±	83.0 5.00b±	85.87 6.89b±	82.23 5.06a±	80.13 4.15a±	81.1 4.01a±
t9	5.0	5.0	93.0 5.87a ±	92.9 6.09a±	92.95 6.02a±	88.82 5.09a±	83.4 5.00ab±	86.33 4.88a±	80.82 5.01a±	78.71 4.60a±	79.73.68a±
Breeder Mean			4.21± 88.69 A	3.48 ±88.1 A		3.89 ±87.53 A	4.02 ±83.9 B		4.45 ±77.80 A	5.00± 73.94 B	

[a—c] Mean values within a column with no common superscript differ significantly (P ≤0.05).
[A—B] Mean values within a row with no common superscript differ significantly (P ≤0.05)

This superiority might be due to many reasons; the most important one is the improvement of the characteristics of the semen both in quantity and quality which was due to the positive effects of the treatment since the fertility is the responsibility of both sexes. These results were identical to what (Saeid et al, 2011) came up with and that was the increase in volume, activity and the motion of the semen in the roosters Ross-308 were due to adding the ginger extract to the drinking water by 5 and 10 %. Also this study agreed with what (Khaki et al, 2009) found which was: adding ginger of 100 mg/body weight in Kg/ day to the diet of (rats) led to an increase in activity, motion and concentration of testosterone hormone and improving the characteristics of the semen, on the other hand March, (1998) noticed that the celery seeds contain androsteron produced by metallization of the Testosterone which is a general steroid for both sexes, also it limits the reproductive diseases(Hamza and Amin, 2007), the other reason may be due to the fact that ginger and celery seeds contain a wide range of nutrient, chemical components, minerals and vitamins of a positive effects to poultry, which improved the production and eventually improving the content of the eggs, (Osama et al, 2010) assured that a lot of important components transferred from the dam to the embryo through the yolk like vitamin E and Selenium. Also the ginger and the celery contain a lot of components like Flavonoids, Limonin, vitamins C and E (Popovic et al, 2006; Fachriya et al, 2007; Kolartovic et al, 2010; Salaby ; Zorba, 2010). Besides, other studies pointed out to the role of ginger in protecting the DNA by oxidizing with Hydro- Peroxide (H_2O_2) and sweeping the free oxygen radicals (Greule et al, 2005). (Speak et al, 1998; Surai; Dvorska, 2002b) noticed that the embryo's tissues are sensitive to the effective oxygen types because it contains high unsaturated long chained fatty acids then decreases the hatching ratio due to the increase embryos mortality. The presence of phenol anti-oxidants in ginger and celery might work on keeping the content of the egg away from oxidization damage as the oxidization components transfer and deposit in the yolk and increase the mechanical adopting to increase the free radicals then increase hatching ratio through their effects on the yolk which is considered the feeding source for the embryo during its developing during hatching (Speake et al, 1998). This result agreed with what (Saeid et al, 2011) accomplished, they noticed decrease in the concentration of Mallondialdehyde and increase in the concentration of Glutathione in the plasma of broiler breeders Ross-308 that have been added the ginger extract with 5 and 10 % concentration in the drinking water.

In the second experiment , it is noticed (table 3) significant differences (P≤0.05) at the hatching age in the Arbor Acres breeder, as the first (free of additives) and the fourth treatments (2.5 ginger) recorded the lowest values comparing with the rest of the treatments in this study, while there were no significant differences in the Ross breeder. In calculating the overall mean of the treatment effects regardless of the breeder, there will be no significant differences between treatments, but concerning the breeders significant differences were found (P≤0.05), the Ross breeder exceeded the Arbor Acres, 45.6 and 43.17g respectively.

TABLE 3: Effect of adding crushed ginger celery seeds and their combinations on broiler breeders' progeny traits.

t			HW (g)			MW(g)			FC(g)		
	Celery	Ginger	Arbor Acres	ROSS	Overall mean	Arbor Acres	ROSS	Overall mean	Arbor Acres	ROSS	Overall mean
t1	0.0	0.0	0.8±41.20 b	1.0±45.80 A	43.40 ±1.3a	2.0±2300.00 d	3.0±2460.00 bc	2380.0 ±8.4c	4.5±3795.5 ab	3.7±4105.5 Ab	3950.50 ±6.9a
t2	0.0	2.5	1.0±44.20 a	1.0±45.00 A	44.60 ±0.6a	1.0±2360.00 d	3.0±2495.00 b	2427.5 ±1.0b	3.8±3775.0 ab	6.2±3957.0 Abc	3866.00 ±6.3b
t3	0.0	5.0	1.0±43.90 a	0.5±45.50 A	44.70 ±0.6a	3.0±2449.00 ab	3.2±2670.00 a	2559.5 ±5.4a	2.5±3896.5 a	5.9±4157.5 A	4024 ±6.6a
t4	2.5	0.0	1.3±41.60 b	0.6±45.20 A	43.40 ±1.1a	6.0±2396.00 c	8.2±2530.00 b	2463.0 ±1.0b	6.1±3755.0 ab	4.2±3974.0 Abc	3864.5 ±6.4b
t5	5.0	0.0	0.8±43.10 ab	0.5±45.30 a	44.20 ±0.7a	8.3±2420.00 bc	6.1±2450.00 bc	2435.0 ±1.7b	4.2±3755.0 ab	2.8±3762.5 Bc	3758.75 ±3.2c
t6	2.5	2.5	0.5±43.30 a	0.1±45.90 A	44.60 ±0.7a	1.0±2350.00 d	2.2±2510.00 b	2430.0 ±7.0b	3.5±3621.5 b	2.9±3928.0 Abc	3774.75 ±8.4c
t7	2.5	5.0	0.2±43.80 a	0.2±46.00 A	44.90 ±0.6a	4.0±2386.00 D	3.1±2520.00 b	2453.0 ±6.7b	5.1±3735.5 ab	5.5±3762.5 Bc	3749.00 ±7.0c
t8	5.0	2.5	0.5±43.50 a	0.1±46.10 A	44.80 ±0.7a	2.5±2448.00 Ab	3.0±2408.00 c	2428.0 ±6.0b	8.5±3811.5 ab	8.2±3662.0 c	3736.75 8.8c
t9	5.0	5.0	1.0±44.00 a	0.2±45.80 a	44.90 ±0.6a	3.1±2537.00 A	5.6±2635.00 a	2586.0 ±8.9a	9.5±3964.5 a	6.4±4013.5 Abc	3989.00 ±8.1a
			0.3±43.17 B	0.1±45.60 A		8.7±2405.11 B	4.9±2519.78 A		9.2±3790.00 B	5.2±3924.72 A	

[a—c] Mean values within a column with no common superscript differ significantly (P ≤0.05).
[A—B] Mean values within a row with no common superscript differ significantly (P ≤0.05)

At the age of 42 days the ninth treatment (5.0 celery with 5.0 ginger) has exceed and was (2537g) in the Arbor Acres followed by the third (5.0 ginger) and the eighth (5.0 celery with 2.5 ginger), without significant differences, were (2449 and 2448) g respectively. While the first treatment (without additives) recorded the lowest value of 2300 g. With the Ross breeder, the ninth treatment (5.0 celery and 5.0 ginger) and the third (5.0 ginger) recorded the highest value of 2635 and 2670 g/ hen comparing with other treatment. Now regarding breeders, Ross breeder exceeded Arbor Acres breeder significant (P≤0.05) with: 2519.78 and 2405.11 g respectively. When calculating the overall mean without considering the breeders, the ninth and the third exceeded the rest of the treatment with: 2586 and 2559 g respectively while the control treatment recorded the lowest value of 2380g. The feed increased in Arbor Acres in the third, ninth and the eighth treatments with the values 3896.5, 3964.5 and 3811.5g comparing with the sixth treatment and the quantity of the consumed feed was (3621) g without any significant differences. With Ross the feed consumption increased (P≤0.05) in the third treatment with 4157.5g comparing with the fifth, seventh and the eighth (3762.5, 3762.5 and 3662) g respectively, with no significant differences between the other treatments. Table (3) also shows significant differences (P≤0.05) between the two breeders, since the feed consumption rose in Ross compared with Arbor Acre breeders: (3924.72 and 3790) g respectively. When calculating the accumulative average to the general feed consumption, the quantity of feed in the third, the ninth and the first treatments (4027, 3989, 3950.5) g /hen respectively comparing with the second and the fourth treatment: 3866 and 3864.5 g/hen respectively while the sixth, fifth seventh and the eighth recorded less feed consumption: 3774.75, 3758.75, 3749 and 3736.75g /hen respectively.

Table (4) shows the effect of adding crushed ginger and the celery seeds and their combinations to the diets in the edible gut ratio and dressing percentage with the edible gut or without them. It is noticeable that there were no significant differences between the experiment and the control treatments in the values of the edible gut for both breeders, the Arbor Acres and the Ross. It can also be noticed from table (4) the existence significant differences in dressing percentage without the edible gut among experiment treatments as the ninth, the fifth, eighth, seventh and the sixth treatments exceeded significant and recorded 74.8, 74.0, 73.9, 73.9 and 73.20% respectively followed by the third, second and the fourth treatments and recorded 72.75, 71.85 and 71.70% respectively while the first treatment recorded the lowest dressing with 70.20 % in the Arbor

Acres breeder whereas with the Ross breeder the seventh, eighth, ninth and the fifth treatments were 74.8, 74.6, 74.4 and 74.2% respectively followed by the sixth, fourth and the third treatments were 72.80, 72.30 and 72.0% respectively and the second and the first treatments recorded the lowest values for the dressing without edible gut in Ross breeder and recorded 70.8, 70.5% respectively, and when calculating the overall mean to the treatment without considering the breeder, the ninth, eighth, fifth, seventh and the sixth recorded scored significant differences ($P \leq 0.05$) and recorded 74.6, 74.25, 74.10, 73.95 and 73.20% respectively which were different from the first treatment (70.35%) and there were no significant differences between the rest of the treatment. Table (4) also indicates that there are no significant differences between the two breeders and the dressing percentage were 72.9 and 72.88% for each one respectively. Table (4) also shows that when calculating the dressing percentage with the edible gut, the dressing percentage was up by the same ratio as the edible gut for all the treatment and for both of the breeders. The positive results obtained when adding crushed ginger and celery seeds and their combinations to the broiler breeders compared with the control one without any additives on the production performance of the generation production such as (body weight, weight access, feed consumption, food conversion factor and dressing percentage) might be due to the ability of the breeders to produce eggs of high quality and eventually giving better performance, (Herawati, 2010) mentioned that to add crushed ginger at 2% led to reduce the consumed feed and increased the efficiency of the food elements reflecting that on the weight of the hatched chicks, those results go along with what (Mohamed et al, 2012) have reached, and on the contrary there were not any significant differences in the food conversion factor when adding 750 g of crushed ginger/100 Kg feed, this result agreed with what (Moorthy, et al, 2009) and (Onimisi et al, 2005). In other studies it was found the ginger contain Curcumene, Limonene and Proteolysis enzymes as well as one of the herbs that improve absorption to over 200% and has an effect of correcting and activating the immune system of the body, the reason may be due to the chicks performance as a result of the effect of the active materials deposited in the eggs (that transferred to the children) as the breeders were fed on diet with adding different ratios of celery seeds and /or ginger which contain active matters such as (flavonoids, linalool, and limonene) in addition to anther oils (Bliddal et al, 2000; Ganguly et al, 2003), and its positive reaction through stimulating the digestive system, liver, pancreas and the formatting of the bile and stimulating its excretion (Vanaclocha; Ganigueral, 2003; Sarinivasan, 2005), and stimulating the digestive enzymes (Ernest, Pitter, 2000). This study also agreed regarding no significant differences between body weight at hatching with the results of (Radwan et al, 2008) which did not notice any significant differences between body weight at hatching from breeders were fed on different levels of additives, but the superiority accomplished in the different growth characteristics towards the children of the special treatment with additives on the control treatment goes to the improvement of the health condition of the hatched chicks and boost the immunity of the poultry (Rahman and Lowe, 2006).

TABLE 4: Effects of adding crushed ginger, celery seeds and their combinations in edible gut ratio and dressing percentage with the edible gut or without them

t			Edible gut ratio**(%)**			Dressing percentage without eatables **(%)**			Dressing percentage with eatables **(%)**		
	Celery	Ginger	Arbor Acres	ROSS	Mean	Arbor Acres	ROSS	mean	Arbor Acres	ROSS	mean
t1	0.0	0.0	0.03±4.11 a	0.05±3.94 a	4.03 ±0.05a	0.10±70.20 e	0.10±70.50 c	70.35 ±0.10c	0.06±74.31 d	0.04±74.44 c	74.38 ±0.04d
t2	0.0	2.5	0.03±3.88 a	0.03±4.08 a	3.98 ±0.06a	0.05±71.85 b	0.30±70.80 c	71.32 ±0.32bc	0.08±75.73 bc	0.27±74.88 c	75.30 ±0.27c
t3	0.0	5.0	0.02±4.05 a	0.09±4.06 a	4.06 ±0.04a	0.05±72.75 b	0.01±72.20 b	72.47 ±0.16b	0.07±76.80 bc	0.05±76.26 b	76.53 ±0.15b
t4	2.5	0.0	0.04±3.86 a	0.03±4.08 a	3.97 ±0.06a	0.010±71.70 b	0.02±72.30 b	72.00 ±0.59b	0.03±75.56 cd	0.06±76.18 b	75.87 ±0.58b
t5	5.0	0.0	0.07±3.92 a	0.04±4.13 a	4.02 ±0.07a	0.50±74.00 a	0.51±74.20 a	74.10 ±0.15a	0.37±77.92 ab	0.24±78.33 a	78.12 ±0.21a
t6	2.5	2.5	0.07±3.99 a	0.01±4.06 a	4.02 ±0.08a	0.40±73.20 ab	0.40±72.80 b	73.00 ±0.25ab	0.47±77.19 abc	0.59±76.86 b	77.02 ±0.32ab
t7	2.5	5.0	0.07±3.93 a	0.05±4.05 a	3.99 ±0.05a	0.40±73.70 ab	0.90±74.80 a	73.95 ±0.20ab	0.47±77.63 ab	0.82±78.25 ab	77.94 ±0.42ab
t8	5.0	2.5	0.04±4.44 a	0.08±4.16 a	4.30 ±0.22a	0.30±73.90 ab	0.60±74.60 a	74.25 ±0.34a	0.19±78.34 ab	0.68±78.76 a	78.55 ±0.31a
t9	5.0	5.0	0.03±4.24 a	0.08±4.06 a	4.15 ±0.16a	0.60±74.80 a	0.20±74.40 a	74.60 ±0.28a	0.98±79.04 a	0.80±78.46 a	78.75 ±0.44a
Breeder Mean			0.06±4.04 A	0.02±4.07 A		0.35±72.90 A	0.37±72.88 A		0.37±76.94 A	0.38±76.93 A	

[a—c] Mean values within a column with no common superscript differ significantly ($P \leq 0.05$).
[A—B] Mean values within a row with no common superscript differ significantly ($P \leq 0.05$)

So we conclude from this pioneer experiment that adding crushed ginger or\and celery seeds to the boiler breeder diets led to improve the important productive and physiological characteristics to the broiler breeder and their progeny, these results may strongly contribute in reaching real solutions to the problems facing growing the breeders, also the improvement in nutrition of the breeders as well as the health and immune state as a result of adding celery and ginger or their combinations might reflect positively on their production and their progeny.

REFERENCES

AsSadoon, M.H. 2005. Ph.D. thesis, Univ. of Mosil, college of Education, Iraq.

Shanoon, U.K. ,2011. Ph.D. thesis, Univ. of Tikrit, college of Agric., Iraq.

Shalal, I,N. and Yosif A.A. 2012. Tikrit J. of Agric. Sci. , 12(2):143-150.

Taha, A.T. , 2008. Ph.D. thesis, Univ. of Mosil, college of Agric., Iraq.

AbdurRahman, S.Y. and AlKattan, M.M. , 2009. Iraqian Veternary Sci, 23(2):377-384.

Akdarian, A.,G. Abolghasem, S. A. and M. Hossein. 2011. J. of Appl. Anim. Sci., 39:19-21.

Bahar, A., T. Alam, M. Varshney and S. A. Khan. 2002. Ethnopharmacol.79:313 -316.

Barreto, M. Z. and J. C. Basillico. 2008.. Lrtt Appl. Microbol., 29:238-241.

Bliddal, H. A., P. Rosetzsky, M. S. Schlichting, L. A. Weidener, H. Andersen, K. Ibfelt, O. N. Christensen, J. Jensen and Barslev. 2000. Osteoarthritis Cartilage, 8: 9-12.

Durranim, F. R., A. Sultan, A. Sajjad, N. Chand, F. M. Khattak and Z. Durrani. 2007. Paks. J. of Biological Std., (20):3718-3721.

Ernest, E. and M. H. Pitter. 2000. Br. J.Anaesth.,84:367-368.

Fachriya, E. A., K. Meiny and Gunardi. 200. Japanese J. Pharmacology., 75:363-370.

Ganguly, N. K., N. Medappa and V. R. Srivastava. 2003. ICMR Bulletin, 33: 57-58.

Greule, M., A. Mosandl, M. Kreck and H. Dietrich. 2005. Deutsche Lebensmittel Rundschau, 101 (5):199-204.

Hamza, A. and A. Amin. 2007.J.Exper.Zool.,307(4):199-206.

Herawat, I. 2010. Int. J. of Poultry. Sci., 9 (10): 963-967.

ICMR. 2003. Indian Council of Medical Research New Delhi, 33(6):57-63

Khaki, A., F. Fathiazad, M. Nouri, A. A. Khaki, H. Jabarikh and M. Hammadeh. 2009. Iranian J. of Reprod. Med., 7 (1): 7- 12.

Kolarovic, J., P. Mira, M. Momir, M. Radoslav and G. Ljiljana. 2010. Molecules, 15 :6193-6204.

March, M. D. 1998. 1st (end) medical economics Co. Moatvale. New Jersey.

Mehmet, C., G. Talat, D. Bestami and N. Ertas. 2005. Int. J.Poultry.Sci.,4:851-855.

Mohamed, A. B., A. M. Mohammed and A. Q. Jalil. 2012. J. of Poultry. Sci.,11(2):224-229.

Moorthy, M., S. Ravi, K. M. Ravi and S. C. Edwin. 2009. Int. J. of Poultry. Sci., 8(8): 779 – 782.

Nasiroleslami, M. and M. Torki. 2010. Adv. in Env. Biol., 4(3):341-345.

Onimisi, P. A., I. I. Dafwang and J. I. Omage. 2005. J. Agric. Forestry and Soc. Sci., 3: 113-119.

Osama, O.M. ; Abdel Wahad, M.S. and M.S. Ragab. 2010. Egypt poultry Sci. 30:893-915.

Patel, K. and R. Srinivasan. 2000. Nahrug., 44:42-46.

Popović, M., B. Kaurinović, S. Trivić, N. Mimica-Dukić and M. Bursać. 2006. Phytother. Res., 20: 531-537.

Radwan, N. L., R. A. Hassan, E. M. Qote and H. M. Favek. 2008. Int. J. of Poultry. Sci., 7(2):134-150.

Raghavan, S. 2007.2nd ed, VRV Press, USA.

Rahman, I. P. and P. T. Lowe. 2006. Archive Tierernahrung, 57: 99-106.

Saeid, J. M., A. K. Shanoon and M. M. Marbut. 2011. Inter. J. of Poultry. Sci., 10(8):629-633.

Sarinivasan, K. 2005. Food Res. Int., 38:77-86.

Shalaby, M. A. and H. Zorba. 2010. Global Veter., 5(2):122-128.

Shalaby, M. A., H. Y. Zorba and M. G. Kamel. 2004. Phannacol. Res., 50(2): 137-142.

Speake, B. K., R. C. Noble and A. M. B. Murray. 1998.World's Poultry. Sci. J., 54:3 19-334.

Surai, P. F. and J. E. Dvorska. 2002a. Archive Geflugelk, 66: 120.

Surai, P. F. and J. E. Dvorska. 2002b. Proceedings of Australian poultry Science Sym. , Sydney, PP. 187-192.

Surai, P. F., B. K. Speake and N. H. C. Sparks. 2003. PP. 211-249. Champaign: AOCS Press.

Surai, P., B. K.Speak, J.P.Brillard, and N.H.C.Sparts. 2001. Asian Aust. J. Anim. Sci., 14 (7):1024-1050.

Surai, P., F. Cerolini, A. Matjin, B. C. Noble and B. K. Speake. 1999.. Proc. 50th International Congress on Animal Reproduction , Milano, P. 603. (cited by Al-khazrajee).

Tagoe, D. N. A., M. Nyarko and R. Akpaka. 2011. Res. J. of Med. Plant, 5(3):281-287.

Tsi, D. and B. Tsi. 2000. I. Life Sci., 66: 755- 767.

Vanaclocha, B. and S. Ganigueral. 2003. fourth ed. Masson, Barcelona, PP. 354-355.

Whitehouse, M. W., D. E. Butters, M. L. Clark and K. D. Ranisford. 2001. Infammopharamacol., 9:201-209.

Zhao, X., Z. B. Yang, W. R. Yang, Y. Wang, S. Z. Jiang and G. G. Zhang. 2011. Poultry. Sci., 90: 1720-1727.